

**What is claimed is:**

1. A loadlock assembly for use with a wafer-processing apparatus including a vacuum chamber, the loadlock assembly comprising a loadlock arranged for transporting wafers from external atmosphere to the vacuum chamber, the loadlock having a first valve which is selectively operable to seal the loadlock from the external atmosphere, a second valve which is selectively operable to seal the loadlock from the interior of the vacuum chamber, and a port for evacuating and pressurizing the loadlock, wherein the first valve has a first width to accommodate wafers transported linearly through the first valve and the second valve has a second width larger than the first width to accommodate wafers transported through the second valve on an arcuate path centred on an axis perpendicular to the second width located on the vacuum chamber side of the second valve.
2. A loadlock assembly according to claim 1, wherein the ratio of the second width to the first width is at least 1.2 to 1.
3. A loadlock assembly according to claim 1, wherein the first and second valves are slit valves.
4. A loadlock assembly according to claim 3, wherein the first and second widths extend in parallel.
5. A loadlock assembly according to claim 4, wherein the first valve is laterally offset relative to the second valve towards the axis.

6. A loadlock assembly according to claim 1, wherein the loadlock assembly has a shape that narrows from the second valve to the first valve.

5 7. A loadlock assembly according to claim 1, further comprising a closure located between the first and second valves that is operable to open to allow access to the loadlock.

10 8. A loadlock assembly according to claim 7, wherein the closure is a hinged lid.

9. A loadlock assembly for use with wafer-processing apparatus including a vacuum chamber, the loadlock assembly comprising first and second loadlocks arranged to be relatively stacked and arranged for transporting wafers from external atmosphere to the vacuum chamber, the first and second loadlocks having respective first and second outer valves which are selectively operable to seal the loadlocks from the external atmosphere, respective first and second inner valves which are selectively operable to seal the loadlocks from the interior of the vacuum chamber, and respective ports for evacuation and pressurization of the loadlocks, wherein the first and second outer valves have a first width to accommodate wafers transported through the first and second outer valves, and the first and second inner valves have a second width larger than the first width to accommodate wafers transported through the first and second inner valves on an arcuate path centred on an axis perpendicular to the second width and located on the vacuum chamber side of the first and second inner valves.

10. A loadlock assembly according to claim 9, wherein the first and second inner valves and the first and second outer valves both comprise opposed slit valves.

5 11. A loadlock assembly according to claim 9, wherein the width of the first and second inner valves and the width of the first and second outer valves all extend in parallel with one another.

10 12. A loadlock assembly according to claim 9 further comprising first and second hinged lids located between the first and second inner valves and the first and second outer valves.

15 13. A loadlock assembly for use with a wafer-processing vacuum chamber, the loadlock assembly comprising a loadlock arranged to transport wafers from external vacuum to the vacuum chamber, a first side of the loadlock having a first valve selectively operable to seal the loadlock from the external atmosphere, the first valve having a first width, a second side end of the loadlock having a second valve selectively operable to seal the loadlock from the interior of the vacuum chamber, the second valve having a second width, the loadlock further comprising a port for evacuating and pressurizing the loadlock, wherein the first width is smaller than the second width and wherein the width of the interior of the loadlock narrows progressively from the second side to the first side.

25 14. A loadlock assembly according to claim 13, wherein the first and second widths extend in parallel with one another and the first valve is offset relative to the second valve

in substantially the same direction as the first and second widths.

15. A loadlock assembly for attachment in a predetermined  
5 orientation to an apparatus operative to process wafers  
comprising a vacuum chamber in which the wafers are  
processed at a wafer processing position and a mechanism for  
transporting the wafers from the loadlock assembly to a  
10 wafer processing position, the mechanism comprising a  
gripper arm for holding the wafers and a robot operable to  
provide rotational motion of said gripper arm at a fixed  
distance about a predetermined axis; the loadlock assembly  
comprising:

15 a loadlock through which wafers are loaded into the  
vacuum chamber, the loadlock having an outer valve which is  
selectively operable to seal the loadlock from the external  
atmosphere, an inner valve which is selectively operable to  
seal the loadlock from the interior of the vacuum chamber,  
and a port for evacuation and pressurization of the  
20 loadlock, the loadlock being arranged, when attached to the  
apparatus, to transport wafers in a plane perpendicular to  
the axis at the same radial distance from the axis so as to  
be engageable by the gripper arm, and wherein the inner  
valve is sized to allow access, when attached to the  
25 apparatus, by the gripper arm to wafers in the loadlock by  
rotation of the robot about the axis without a substantial  
change in the distance of the gripper arm from the axis.

16. A loadlock assembly for attachment in a predetermined  
30 orientation to an apparatus operative to process wafers  
comprising a vacuum chamber in which the wafers are  
processed at a wafer processing position, and a mechanism

for transporting the wafers from the loadlock assembly to the wafer processing position comprising a gripper arm for holding wafers and a robot operable to provide rotational motion of said gripper arm at a fixed radial distance about 5 a predetermined and axis; the loadlock assembly comprising:

first and second loadlocks through which wafers are loaded into the vacuum chamber, the first and second loadlocks having respective first and second outer valves which are selectively operable to seal the loadlocks from 10 the external atmosphere, respective first and second inner valves which are selectively operable to seal the loadlocks from the interior of the vacuum chamber, and respective parts for evacuation and pressurization of the loadlocks, the loadlocks being relatively stacked and arranged when 15 attached to the apparatus to transport wafers in respective planes perpendicular to the axis at the same radial distance from the axis so as to be engageable by the gripper arm, and wherein the first and second inner valves are sized to allow access, when attached to the apparatus, by the gripper arm 20 to wafers in the loadlocks by rotation of the robot about the axis without a substantial change in the distance of the gripper arm from the axis.

17. An apparatus for processing wafers comprising a vacuum 25 chamber in which the wafers are serially processed at a wafer processing position, a loadlock through which the wafers are loaded into the vacuum chamber, and a mechanism for transporting the wafers from the loadlock to the wafer processing position, the loadlock having an outer valve 30 which is selectively operable to seal the loadlock from the external atmosphere, an inner valve which is selectively operable to seal the loadlock from the interior of the

vacuum chamber, and a part for evacuation and pressurization of the loadlock, the mechanism for transporting comprising a gripper arm for holding wafers, and a robot operable to provide rotational motion of the gripper arm at a fixed 5 radial distance about a predetermined axis, the loadlock being arranged to transport wafers in a plane perpendicular to the axis at the same radial distance from the axis so as to be engageable by the gripper arm, and wherein the inner valve is sized to allow access by the gripper arm to wafers 10 in the loadlock by rotation of the robot about the axis without a substantial change in the distance of the gripper arm from the axis.

18. An apparatus for processing wafers comprising a vacuum 15 chamber which the wafers are serially processed at a wafer processing position, first and second loadlocks through which the wafers are loaded into the vacuum chamber, and a mechanism for transporting the wafers from the loadlocks to the wafer processing position, the first and second 20 loadlocks having respective first and second outer valves which are selectively operable to seal the loadlocks from the external atmosphere, respective first and second inner valves which are selectively operable to seal the loadlocks from the interior of the vacuum chamber, and respective 25 ports for evacuation and pressurization of the loadlocks, the mechanism for transporting comprising a gripper arm for holding wafers, and a robot operable to provide rotational motion of the gripper arm at a fixed radial distance about a predetermined axis, the loadlocks being relatively stacked 30 and arranged to transport wafers in respective parallel planes perpendicular to the axis at the same radial distance from the axis so as to be engageable by the gripper arm, and

wherein the first and second inner valves are sized to allow access by the gripper arm to wafers in the loadlocks by rotation of the robot about the axis without a substantial change in the distance of the gripper arm from the axis.

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19. An apparatus according to claim 18, wherein the gripper arm is driven by a robot which requires only axial motion in the direction of the axis about which the gripper arm is pivoted, and rotational motion is about this axis.

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20. An apparatus according to claim 18, wherein a second gripper arm is provided which is axially moveable together with the first gripper arm and is rotatable about the axis independently of the first gripper arm.

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